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10/629,289	07/28/2003	Zhang-Lin Zhou	200209757-1	6483

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HEWLETT PACKARD COMPANY
P O BOX 272400, 3404 E. HARMONY ROAD
INTELLECTUAL PROPERTY ADMINISTRATION
FORT COLLINS, CO 80527-2400

EXAMINER	
HUANG, MEI QI	
ART UNIT	PAPER NUMBER
1713	

DATE MAILED: 03/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

LD

Office Action Summary	Application No. 10/629,289	Applicant(s) ZHOU ET AL.	
	Examiner Mei Q. Huang	Art Unit 1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) 16-33 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 15 is/are rejected.
- 7) ☒ Claim(s) 12-14 is/are objected to.
- 8) ☒ Claim(s) 1-33 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

RE

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-15, drawn to a method of generating functionalized latex particulates, classified in class 524, subclass 700.
 - II. Claims 16-33, drawn to methods of preparing an ink-jet ink and ink-jetable protective overcoat material, classified in class 106, subclass 31.13.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the functionalized latex particulates can be made by different mechanisms such as the modification of carbonyl surface groups. The subcombination has separate utility such as a method of making a surface modified substrate used in biological field, for example, a substrate for immobilization of proteins or nucleic acid.
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

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4. Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.
5. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.
6. During a telephone conversation with Attorney, Mr. W. Bradley Haymond, on February 24, 2005 a provisional election was made with traverse to prosecute the invention of I, claims 1-15. Affirmation of this election must be made by applicant in replying to this Office action. Claims 16-33 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.
7. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Specification

8. The disclosure is objected to because of the following informalities: On page 2, line 3, the phrase "one mechanism has been by copolymerization of" needs to be revised. Appropriate correction is required.

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Claim Objections

9. Claim 5 is objected to because of the following informalities: The format of the selective groups for the photo labile group is improper because Markush terminology requires the phrase "selected from the group consisting of" and the connector "and" between the last two members. See MPEP 2173.05 (h). Appropriate correction is required.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

12. Claims 1-11 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over McGall et al. (US Patent 5,412,087) in view of Ananiev (US Pub. 2002/0058252).

The prior art to McGall et al. teaches substrates with surfaces comprising compounds with thiol functional groups protected with a photo-removable protecting group (Abstract). McGall et al. teach that the protecting groups will be, more preferably, attached to the compounds carrying the thiol functional group *prior to attaching* the thiol functional group to the surface of the substrates (column 5, line 32-38). McGall et al. first protect the thiol functional group with a photo-removable protecting group which appears to read on the limitation of step (a) in applicant's claim 1. Then, McGall et al. attach/graft the compound carrying the protected thiol functional group onto the surface of a substrate to make a protected polymer, which appears to read on the limitation of step (b) in applicant's claim 1. McGall et al. further teach that, after attaching the compound carrying the protected thiol functional group to the surface of a substrate, the protected thiol is convertible by irradiation to a fully reactive thiol (column 3, line 5-8), which appears to read on the limitation of step (c) in applicant's claim 1.

McGall et al. disclose that the substrate to which the compound carrying the protected thiol functional group is attached can be biological, nonbiological, organic, inorganic or a combination of any of these materials, existing as particles, gel, etc. However, McGall et al. are silent as to the form of latex for their product. The prior art to Ananiev discloses a method of selecting sets of short shared nucleotide sequences from amongst members of nucleic acid populations and identifying subsets of those selected short shared nucleotide sequences that differentiate those members from one another (Abstract). Ananiev's method involves modifying the surface of a solid support with linking groups having photolabile protecting groups (e.g. NVOC or MeNPoc) and illuminating

through a photolithographic mask, yielding reactive groups (e.g. typically hydroxyl groups) in the illuminated regions (page 8, [0076]). Ananiev teaches that the solid support materials include, but are not limited to paper, ..., polystyrene, polystyrene/latex. The solid substrates are biological, nonbiological, organic, inorganic, or a combination of any of these, existing as particles, gels, etc. (page 5, [0043]). Since the surface modified substrates of McGall et al. and Ananiev belong to the same category, i.e. biological, nonbiological, organic, or inorganic, existing as particles, gels, etc., and both share the same industrial applicability, for example, immobilization of biological polymers, it would have been obvious to one having ordinary skill in the art at the time the invention was made to include the latex, as taught by Ananiev, as an additional physical form of McGall et al.'s product, and thus to arrive the limitation of latex in claim 1, motivated by the expectation of success.

As to Claims 2-4, McGall et al. use the compounds carrying thiol functional group in their inventive embodiments and also disclose other reactive groups such as carboxyl, amino, hydroxyl (column 6, line 34-), which reads on applicant's claims 2-4.

As to Claims 5 and 6, McGall et al. teach that many different protecting (caging) groups can be employed for modifying thiol groups to give the caged thiols (column 7, line 66-68) and examples of such caging groups include 6-nitroveratryloxycarbonyl (NVOC) (column 8, line 26-27) which reads on applicant's claim 5. McGall et al.'s compound, thiolpropionic acid ($\text{HSCH}_2\text{CH}_2\text{CO}_2\text{H}$) used in their working example 1 (column 13, line 47-48), appears to read on applicant's claim 6.

As to Claim 7, McGall et al. and Ananiev teach that their products are materials of biological, nonbiological, organic, or inorganic. Both prior arts do not specify the average molecular weight for their products. However, since applicant does not specify the product, it is the examiner's position to believe that the prior art products must inherently possess the average molecular weight, which would cover or be within the claimed molecular weight range. Since the PTO does not have proper means to conduct experiments, the burden of proof is now shifted to the applicant to establish an unobviousness difference. *In re Best*, 562 F.2d 1252, 195 USPQ 430 (CCPA 1977). *In re Fitzgerald*, 205 USPQ 594 (CCPA 1980).

As to Claims 8 and 9, McGall et al. teach that the substrate is unreactive until *specific sites* are activated with light (column 3, line 37-38), which appears to meet applicant's claim 8. McGall et al. also teach that the free protecting group may or may not undergo decomposition reactions (column 5, line 50-51), which appears to cover applicant's claim 9.

As to Claims 10 and 11, McGall et al. teach that the photosensitive cages will be activatable by low energy ultraviolet or visible light, for example, 6-nitroveratryloxycarbonyl (NVOC) (column 8, line 10-37) and its corresponding wavelengths of UV 300-350 nm for deprotection is shown in Table 1, column 8.

As to Claim 15, McGall et al.'s method of making the surface modified substrate includes crosslinking groups selected from the compounds, for example, aryl acetylenes, etc. (column 6, line 46-48). McGall et al. attach the compounds carrying the protected thiol group to the surface of substrates through the use of the crosslinking groups.

Allowable Subject Matter

13. Claims 12-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The instant claims are allowable over the closest reference to McGall et al. (US Patent 5,412,087). The claims include covalently coupling thiolpropionate having a photochemically removable protecting group to functional groups on a surface of a solid support and illuminating the surface with a light to remove said photochemically removable protecting group from the thiolpropionate.

Conclusion

The prior art made of record but not relied upon is considered pertinent to applicant's disclosure. The following references have been cited to show the state of the art with respect to the study of photolabile groups and their use.

US Patent 5,489,678 to Fodor et al.

US Pub. 2003/0144499 to McGall et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mei Q. Huang whose telephone number is (571) 272-3549. The examiner can normally be reached on 8am - 4pm, Mon. - Fri..

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on (571) 272-1114. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mei Q. Huang
Patent Examiner

March 3, 2005



DAVID W. WU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700